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UTILITY PATENT APPLICATION TRANSMITTAL

(for nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No.

WICP.68041

Express Mail No.

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TO: Box Patent Application  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Inventor(s): Robert D. Tyler

Title: METHOD FOR PRODUCING CONTOURED VEHICLE FLOOR MATS HAVING INTEGRALLY FORMED NIBS

Enclosed are:

<input checked="" type="checkbox"/>	14 pages of specification including abstract				
<input checked="" type="checkbox"/>	2 sheets of drawings				
<input checked="" type="checkbox"/>	an assignment of the invention to: Winfield Consumer Products, Inc.				
<input checked="" type="checkbox"/>	Declaration of Inventor	<input checked="" type="checkbox"/>	Newly executed	<input type="checkbox"/>	Copy from a prior application (for contin/div)
<input type="checkbox"/>	Incorporation by Reference: the entire disclosure of the prior application, from which a copy of the oath or declaration is supplied, is considered to be part of the disclosure of the accompanying application and is hereby incorporated by reference therein.				
<input checked="" type="checkbox"/>	a small entity statement is enclosed.				
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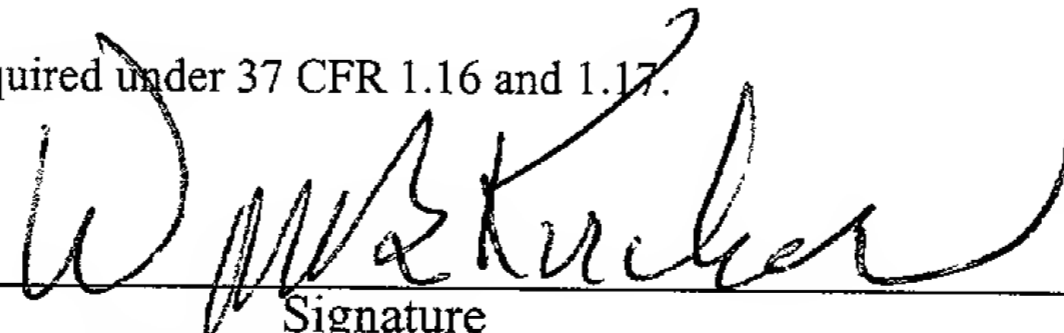
If a Continuing Application: Check appropriate box, and supply the requisite information below:

<input type="checkbox"/>	Continuation	<input type="checkbox"/>	Divisional	<input type="checkbox"/>	Continuation-in-Part (CIP)	of prior application No.
Prior application information: Examiner:						Group Art Unit:

CLAIMS AS FILED

	NUMBER FILED	NUMBER EXTRA	RATE	FEE
BASIC FEE			\$760	\$ 760
TOTAL CLAIMS	21 - 20 =	1	X \$ 18	\$ 18
INDEPENDENT CLAIMS	3 - 3 =	0	X \$ 78	\$
MULTIPLE DEPENDENT CLAIM PRESENT			\$260	\$
* Number extra must be zero or larger				TOTAL \$ 778
If applicant has small entity status under 37 CFR 1.9 and 1.27, then divide total fee by 2, and enter amount here.				SMALL ENTITY TOTAL \$ 389

<input checked="" type="checkbox"/>	A check in the amount of \$389.00 to cover the filing fee is enclosed.
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9/30/99  
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**PATENT****IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Robert D. Tyler

Attorney Docket No. WICP.68041

METHOD FOR PRODUCING

CONTOURED VEHICLE FLOOR MATS

HAVING INTEGRALLY FORMED NIBS

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY  
STATUS (37 CFR 1.9(d) and 1.27(c)) SMALL BUSINESS CONCERN**

I hereby declare that I am an official of the small business concern empowered to act on behalf of the concern identified below:

Name of Concern:

Winfield Consumer Products, Inc.

Address of Concern:

135 N. "D" St.

P.O. Box 839

Strother Field

Winfield, Kansas 67156

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 CFR 121.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time, or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled METHOD FOR PRODUCING CONTOURED VEHICLE FLOOR MATS HAVING INTEGRALLY FORMED NIBS by inventor Robert D. Tyler described in the specification filed herewith.

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(d) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

Name: \_\_\_\_\_

Address: \_\_\_\_\_

☐ individual ☐ small business concern  
☐ nonprofit organization

Name: \_\_\_\_\_

Address: \_\_\_\_\_

☐ individual ☐ small business concern  
☐ nonprofit organization

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Name of Person Signing: Robert D. Tyler  
 Title of Person Other than Owner: President  
 Address of Person Signing: 135 N. "D" St.  
 P.O. Box 839  
 Strother Field  
 Winfield, Kansas 67156

Robert D. Tyler, president  
 Signature

9/29/99  
 Date

**METHOD FOR PRODUCING CONTOURED VEHICLE FLOOR MATS  
HAVING INTEGRALLY FORMED NIBS**

**CROSS-REFERENCE TO RELATED APPLICATIONS**

Not Applicable.

**STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR  
DEVELOPMENT**

Not Applicable.

**BACKGROUND OF THE INVENTION**

This invention relates generally to a method for manufacturing plastic floor mats for vehicles. More specifically, the invention relates to a method for manufacturing plastic floor mats molded to correspond with the three dimensional profile of the interior of a vehicle floor and having a plurality of integrally molded nibs on the surface of the mats to contact the vehicle's floor covering.

Mats are often placed over the floor board of a vehicle to protect the floor covering. Particularly, mats are useful to prevent the carpet or other floor covering from becoming worn, stained or otherwise damaged by the occupants of the vehicle or items stored within the vehicle.

Protective vehicle mats come in a variety of shapes and sizes. One typical prior art mat is a mat constructed from a flat sheet made of fabric, rubber or plastic material. The mats are typically flexible and are laid across the floor board surface of the vehicle. One drawback of these type of mats is that they tend to slide across the floor board due to the forces applied by the passengers of the vehicle or by the motion of the vehicle itself. One prior art solution to this problem is to apply protrusions such as nibs to the surface of the mats contacting the floor board. Typically,

the nibs are formed as small spikes with pointed ends that grip the floor board surface of the vehicle.

The nibs are generally equally distributed across the underlying surface to provide a number of individual contact areas. The main drawback of these flat mats is that they do not effectively cover the contoured surfaces of the floor board. Specifically, the flat mats are not effective for protecting the corners of the vehicle floor board or those areas having more complex surface shapes. Further, even those flat floor mats having nibbed surfaces tend to move along the floor board since the nibs are not in contact with the large, contoured area of the floor board and do not benefit from the lateral support afforded contoured mats.

Some prior art mats are produced to closely correspond to the shape of a vehicle floorboard and overcome the problems inherent with flat sheets. The complementary shape of the contoured mat mates with the vehicle floorboard to hold the mat into place. However, the prior art processes for producing these contoured mats have a number of shortcomings. One prior art process is the use of thermoforming to produce a multi-dimensional, contoured mat. In this process, a polymer sheet is placed over a solid molding form defining the shape of the mat. The sheet is softened by heating in an oven and is held to the form by either vacuum or air pressure forcing the sheet against a female or male tool. However, while this prior art method has been effective for forming appropriately shaped mats at a relatively low cost, the prior art thermoforming processes do not disclose a method for forming integral nibs on the mat. In some cases, manufacturers have attached a plate having a nibbed surface to the bottom of the thermoformed mat as part of a secondary operation. Typically, the plate is secured to the mat by a mechanical means or by one of a variety of adhesives. Besides requiring an additional step, the mats formed in this manner typically only have nibs on the lower, flat portion of the mat surface. The contoured portion of the mats, such as the upwardly extending sidewalls of typical floorboards are left smooth and do not grip the floor

covering of the vehicle. Also, in some situations, the fixed plate may either become loose or partially separated from the contoured mat.

Some prior art processes have produced integrally formed nibs on the underside of a contoured mat. One example of such a process is injection molding. In this method, molten material is injected into the cavity and cooled to form the final part. In another process, used primarily with rubber mats, the mat is compression molded within a closed mold placed under pressure. However, these processes are particularly, if not prohibitably, costly. Accordingly, a process is needed that allows nibs to be integrally formed within a multi-dimensional, contoured mat without the costs associated with these expensive prior art techniques.

## **BRIEF SUMMARY OF THE INVENTION**

It is an object of the present invention to provide a method for producing contoured vehicle mats having integrally formed nibs that is significantly less costly than prior art methods.

A further object of the present invention is to provide a method for manufacturing plastic vehicle floor mats having integrally formed nibs using a thermoforming process.

Another object of the invention is to provide a process for forming contoured floor mats having integrally formed nibs by using an extrusion process to form the nibs and a thermoforming process to provide the contour to the mats.

According to the present invention, the foregoing and other objects are achieved by extruding a thermoplastic material through a roll stack having a roll having a plurality of indentions for forming nibs. The heated material is pressed onto the surface of the central roller by an adjacent roller so that material fills the indentions to form nibs on one side of the sheet. As the sheet is pulled from the central roller, the integrally formed nibs are released from the indentions. Next, the

5 sheets are cooled and cut into blanks for forming the mats. The blanks are placed within a thermoforming station with the nibbed side of the blank directed away from the surface of the molding tool. The blank is heated to a plastic state and drawn toward the contoured tool by vacuum pressure. Thereafter, the blank is stretched over the tool to form the contoured shape desired for the particular vehicle. Thus, a contoured, plastic vehicle mat having integrally formed nibs on the underside of the mat is produced using the thermoforming process.

10 Additional objects, advantages and novel features of the invention will be set forth in part in the description which follows, and in part will become apparent to those skilled in the art upon examination of the following, or may be learned from practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

#### **BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS**

15 A preferred embodiment of the present invention will be described below with reference to the attached drawing, wherein:

Fig. 1 is an elevational schematic view of the vehicle mat production line according to the present invention;

Fig. 2 is an enlarged, partial side elevational view of the extruder of the present invention;

20 Fig. 3 is an enlarged, fragmentary side elevation view of the extruding rollers of the present invention;

Fig. 4 is an enlarged view of the extrusion rollers within the captured region 4 of Fig. 3;

Fig. 5 is a perspective view of the thermoforming molding tool of the present invention; and

Fig. 6 is a perspective view of a vehicle floor mat made in accordance with the present invention.

## DETAILED DESCRIPTION OF THE INVENTION

Referring to Fig. 1, a vehicle mat production line generally designated by the numeral 10 is shown. Specifically, the production line is directed to a method for manufacturing plastic vehicle mats having a contoured, multi-dimensional shape. Nibs or similar structures are integrally formed on the underside of the mats to prevent the mats from slipping on the surface of the vehicle covered by the mats. The mats may be placed in the driver floorboard, the passenger floorboard, or the backseat floorboard. Furthermore, the mats may serve as cargo liners and be formed to fit the trunk of an automobile or the storage area of a van, truck, or sport utility vehicle.

The vehicle mat production line 10 includes an extruder 12, a first conveyor 14, a second conveyor 16, a run-out table 18 and a thermoforming station 20. Generally, the nibs are integrally formed in the mat material at the extruder 12 and the form fitting contour is molded at the thermoforming station 20.

With additional reference to Fig. 2, the extruder 12 includes a feed hopper 22, an extrusion barrel 24, a die 26 and a roll stack 28. Generally, feed material in the form of pellets or granules is placed within feed hopper 22. The feed material is a combination of a linear low density polyethylene material and one of a group of thermoplastic elastomeric (T.P.E. or T.P.O.) materials. The linear low density polyethylene material enhances melt strength in thermoforming process and increase wearability (or durability) of the floor liner. A linear low density polyethylene material sold

by Phillips Petroleum under the name K203 is used. The thermoplastic material is one of a group of thermoplastic elastomers. Most preferably, the thermoplastic elastomers is either a blend of polypropylene and EPDM rubber or a blend of polypropylene, EPDM rubber and EVA. For example, two particular blends of polypropylene and EPDM rubber are sold by the Advanced Elastomers Systems, Akron, Ohio, under the names VYRAM and SANTOPRENE. An example of an effective blend of polypropylene, EPDM rubber and EVA is sold by the same company under the name VISTAFLEX. In the most preferred embodiment, the feed material is a blend constituting 60% of the K203 low density polyethylene and 40% of the VYRAM thermoplastic elastomer. The examples of thermoplastic elastomers are representative, and various other thermoplastic elastomers having similar melt strength and other physical characteristics may be advantageously used in the part forming process. Similar, blends having various ratios of low density polyethylene and thermoplastic elastomer material may be used without departing from the scope of the invention.

The feed material slides downwardly from the feed hopper 22 and into the extrusion barrel 24. In the barrel, a screw (not shown) heats the material until the plastic reaches a homogenous fluid state. With the preferred material blend discuss above, the extrusion occurs at a temperature between 395-420 degrees Fahrenheit and at a pressure between 1800-2400 psi. With additional reference to Fig. 2, the screw forces the material through a screen pack 30 located at the end of the barrel. The screen pack 30 filters the plastic material and supplies back pressure to the material remaining in the extrusion barrel 24. Next, the plastic material is forced through a valve die adaptor 32 and finally through an orifice (not shown) in die 26. The shape of orifice of the die 26 defines the cross sectional profile of the material exiting the barrel 18. Heretofore, the extrusion process discussed above is conventional in the art of plastic extrusion processes.

With reference to Fig. 3, once the extruded material 34 exits the die 26, it enters the roll stack 28 of the present invention. The roll stack 28 is comprised of lower roll 36, a central nib-forming roll 38 and an upper roll 40. The lower roll is generally smooth (or is minimally textured) and rotates in a first rotated direction. As shown in Fig. 4, the nib-forming roll 38 has a plurality of indentions 42. Each indention 42 has a tapered sidewall that define a small cavity. The sidewalls meet to form a rounded or sharply pointed end at the bottom of the indentions. The indentions 42 are preferably spaced equally from one another to create an equal dispersion pattern of nibs in the sheet. However, the indentions may be formed in any of a variety of geometric configurations. For instance, in some embodiments, it may be desirable to have a higher concentration of nibs along the periphery of the sheet to enhance gripping at the more contoured surfaces of the vehicle surface.

To form the nibs, the extruded material 34 is pressed between the lower roll 36 and nib forming roll 38. The material 34 is pushed into the form of a mat sheet 46 due to the pressure between the rolls 36 and nib forming roll 38 which rotates in a second direction opposite from lower roll 36. As the mat sheet 46 is formed, some of the thermoplastic material is forced into and fills the indentions 42 of nib forming roll 38. With still further reference to Fig. 4, as the mat sheet 46 rolls around nibbed roller 38, the nibs 44 remain in the indentions 42 until the upper roll 40 pulls the mat sheet 46 from the nib forming roll. As the mat sheet 46 is spooled onto upper roll 40, rotating in the direction opposite from nibbed roll 38, the nibs 44 are released from the indentions in the nib forming roll 38.

Next, the mat sheet 46 is directed along the inclined first conveyor 14. The conveyor is driven by a conventional pull roll 48. At this stage in the production line 10, the mat sheet is sheared along its edges by a shear cutter 49 to define a mat sheet of constant width. Moreover, the sheet 46 cools as it proceeds down the first conveyor 14. Next, the mat sheet 46 travels along the

second conveyor 16. At the end of the generally horizontal second conveyor 16, the sheet 46 is forced downwardly by a pneumatic hold down 50. The mat sheet 46 is sheared into mat blanks 52 at the shear table 54. At this point, the mat blanks 52 are removed from the run out table 18 of the first stage of the production line 10. As shown in Fig. 5, the mat blanks 52 may be sized to produce a single mat or may be of an appropriate size to be simultaneously molded into a number of mats.

With reference now Figs. 1 and 5, the thermoforming component of the vehicle mat production line 10 is shown. The thermoforming station 20 generally includes a loading station 54, an oven 56 and a mold 58 located within the oven 56. The blanks 52 are placed on the conventional loading station 54 and transported into the oven 56. In the novel method of the present invention, the mat blank 52 is loaded on the loading station 54 so that smooth (or slightly textured) side 60 is directed toward the mold 58 and the nibbed side 62 is directed in the direction opposite the mold. Next, the mat blank 52 is placed directly over the mold 58. The mold 58 is preferably a male tool contoured to shape the vehicle surface to be covered by the mat. The mold 58 has a block-like base 64, an upstanding form 66 on the upper surface of the base 64 and a flat peripheral ledge 68 between the outer edge of the form 66 and the edge of the base 64. In the preferred embodiment, the form 66 includes upwardly extending sidewalls 70 and a top 72. As would be understood, the form 66 may take any of a wide variety of complex shapes have a plurality of curved, flat and transitional surfaces typical of the interior floorboards of passenger vehicles, and cargo areas of a variety of trucks, vans and sport utility vehicles.

The mold 58 includes a plurality of vacuum apertures 70 formed thereon. To form the mat blank 52 into the formed mat 72, the blank 52 is heated by the oven 56 and the negative vacuum pressure applied through vacuum apertures 70 draws the blank toward the mold 58. While the preferred embodiment relies solely on vacuum pressure, the inventive technique also

contemplates methods of utilizing differential pressure to force the blank into contact with the mold (i.e pressure or a combination of pressure and vacuum). The hot plastic blank 52 is pulled in contact and held against the surface of the mold 58. The plastic cools to form the mat 72 shown in Fig. 6. Then, the mats 72 are removed from the mold. If necessary, the outer periphery of the mats may be trimmed to confirm the mat to the shape of the vehicle surface to be covered.

In the preferred embodiment, the mat 72 has a relatively flat base 74 and a number of upstanding sidewalls 76 shaped by the upstanding form 66 and against ledge 68. As mentioned before, this shape is merely illustrative of a typical driver or passenger side floor board, and a number of differently shaped mats, such as cargo liners, may be formed according to this inventive process.

The process of the present invention is particular well-suited for producing vehicle mats. However, parts suitable for different applications may be produced by thermoforming nibbed sheets in accordance with the thermoforming process of the present invention. Furthermore, the use of a thermoplastic blend, particularly the preferred blend, allows the nibs to be formed by an extrusion roller and produces a sheet ideally suited for the thermoforming process of the present invention.

The inventive method overcomes the problems of prior art thermoforming processes by placing the nibs into a sheet of material prior to thermoforming, and directing the nibs in the direction opposite the male tool. The inventive method of thermoforming contoured plastic vehicle mats from sheets having integrally formed nibs is advantageous for a number of reasons. First, the only processes previously known for forming such shapes involve complex tooling such as cavity molds that greatly increase the price of the product to the consumer. The other processes for incorporating nibs onto a contoured mat involve mechanically or adhesively fastening a sheet of nibs

to the underside of the mat. In addition to adding an extra step in manufacturing and the problems associated therewith, it was difficult to place nibs entirely across the lower surface of the mat. In the method of this invention, not only are the nibs capable of being formed on all of the surfaces of the mats, the nibs are directed in the direction substantially perpendicular to the surface and are extremely effective for gripping the interior surfaces of the vehicle. Furthermore, the process allows nibbed mats to be formed in a infinite variety of shapes at a relatively low cost. Further, mats may be formed to completely line and cover the vehicle floorboards and cargo areas while tightly gripping those surfaces with the dispersed pattern of nibs formed throughout the mat.

While preferred embodiments and particular applications of this invention have been shown and described, it is apparent to those skilled in the art that many other modifications and applications of this invention are possible without departing from the inventive concepts herein. It is understood that substitutions may be made and equivalents employed herein without departing from the scope of the invention as recited in the claims.

## CLAIMS

1. A method of producing a vehicle mat comprising the steps of:  
providing a sheet of thermoplastic material, said sheet having a first and second side, said second side having a plurality of nibs extending therefrom;  
locating said sheet in proximity with a contoured molding tool, said first side directed toward said tool and said second side directed away from said tool;  
heating said sheet; and  
drawing said sheet toward said tool until said sheet is substantially shaped to the contour of said tool.
2. The method of claim 1, wherein said thermoplastic material is a thermoplastic elastomer.
3. The method of claim 1, wherein said sheet is drawn toward said tool by differential pressure.
4. The method of claim 1, wherein said vacuum pressure is applied through vacuum apertures in said tool.
5. The method of claim 1, wherein said tool is a male tool.
6. The method of claim 5, wherein said male tool includes a contoured form upstanding from a flat base.
7. The method of claim 1, wherein said sheet is a blank for producing at least one mat.
8. The method of claim 1, further comprising the steps of cooling said sheet and removing said sheet from said tool.

9. A method of producing a plastic vehicle mat comprising the steps of:

extruding a sheet of thermoplastic material between a pair of rollers wherein one of said rollers has a plurality of indentions to form nibs on a first side of the sheet;

locating said sheet in proximity with a contoured male molding tool, said first side directed away from said tool;

heating said sheet to a plastic state; and

drawing said sheet toward said male molding tool until said sheet is substantially shaped to correspond to the contour of said tool.

10. The method of claim 9, wherein said thermoplastic material is a thermoplastic elastomer.

11. The method of claim 9, wherein said thermoplastic elastomer is a blend of a linear low density polyethylene and thermoplastic elastomers.

12. The method of claim 9, wherein said sheet is drawn toward said tool by vacuum pressure.

13. A method of producing a part comprising the steps of:

providing a sheet of thermoplastic material, said sheet having a first and second side, said second side having a plurality of nibs extending therefrom;

locating said sheet in proximity with a contoured molding tool, said first side directed toward said tool and said second side directed away from said tool;

heating said sheet; and

drawing said sheet toward said tool until said sheet is substantially shaped to the contour of said tool.

14. The method of claim 13, wherein said thermoplastic material is a thermoplastic elastomer.

15. The method of claim 13, wherein said thermoplastic material is a blend of a linear low density polyethylene and a thermoplastic elastomer.

16. The method of claim 13, wherein said sheet is drawn toward said tool by differential pressure.

17. The method of claim 13, wherein said vacuum pressure is applied through vacuum apertures in said tool.

18. The method of claim 13, wherein said tool is a male tool.

19. The method of claim 18, wherein said male tool includes a contoured form upstanding from a flat base.

20. The method of claim 13, further comprising the steps of cooling said sheet and removing said sheet from said tool.

21. The method of claim 13 further comprising the step of extruding a sheet between a pair of rollers wherein one of said rollers has a plurality of indentions to form nibs on a first side of the sheet.

## **ABSTRACT OF THE DISCLOSURE**

A method of producing contoured vehicle floor mats having integrally formed nibs.

The sheet is formed by a nib forming roll in an extrusion roll stack having a plurality of indentions.

The nibbed sheet is placed onto the thermoform mold with the nibs directed away from the mold.

The sheet is heated to a plastic state and stretched over the mold to form a contoured mat shaped to

vehicle within a vehicle compartment, trunk or cargo area. The nibs on the underside of the mat

contacts the floor covering and prevents the mats from sliding on the interior surface of the vehicle.

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Fig. 1.

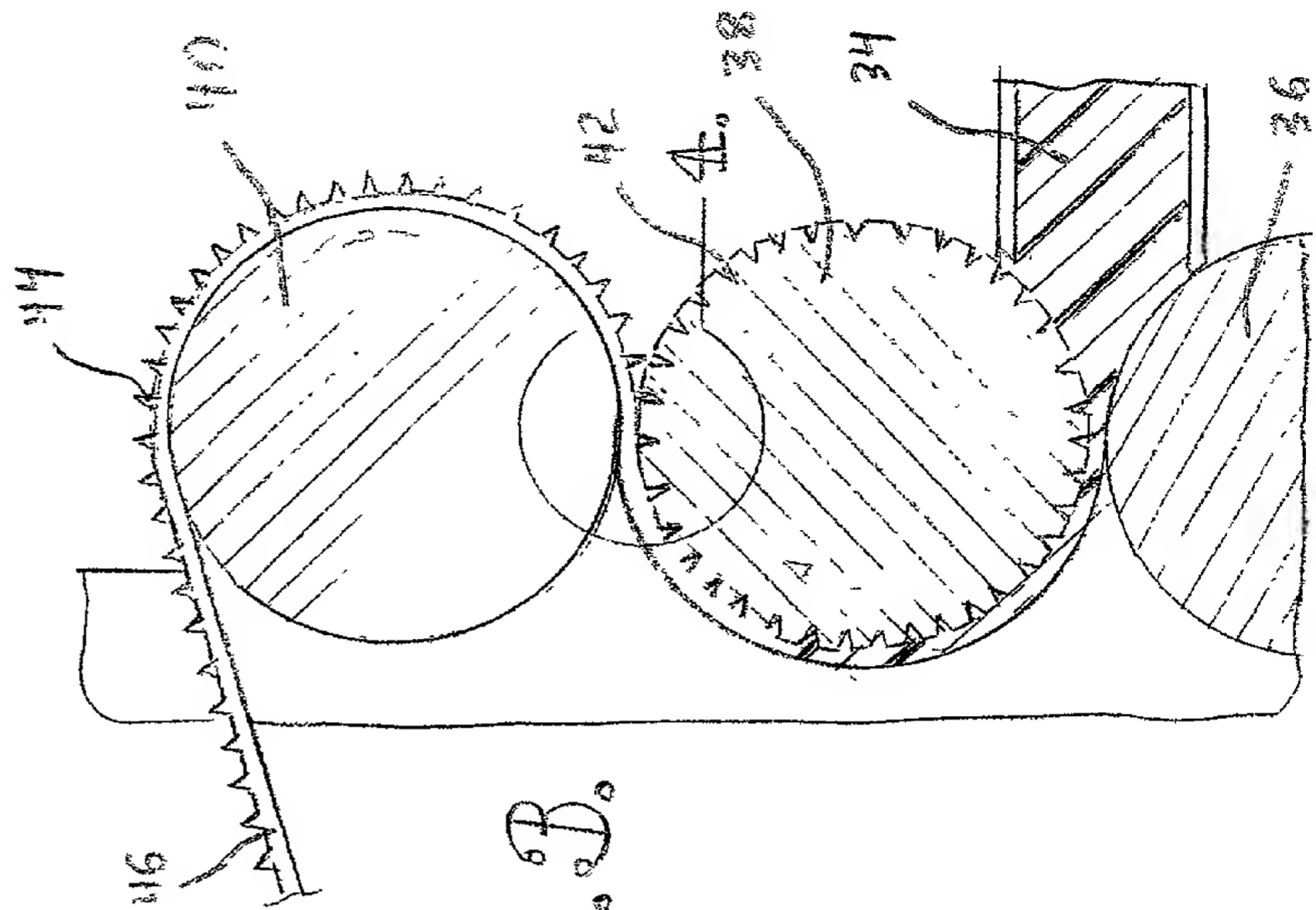
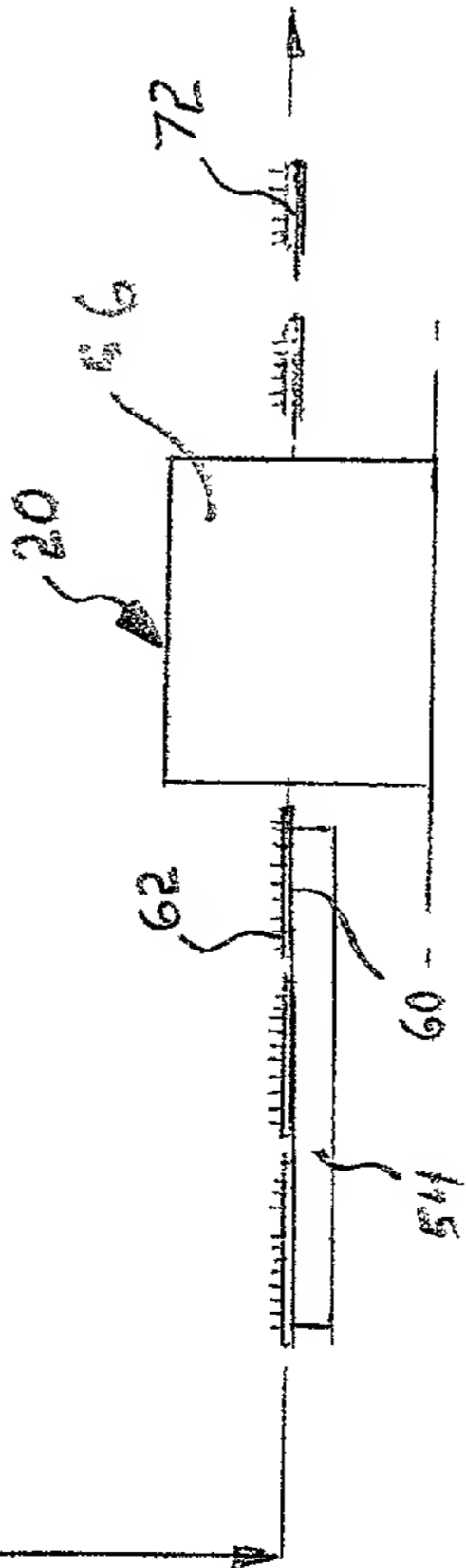
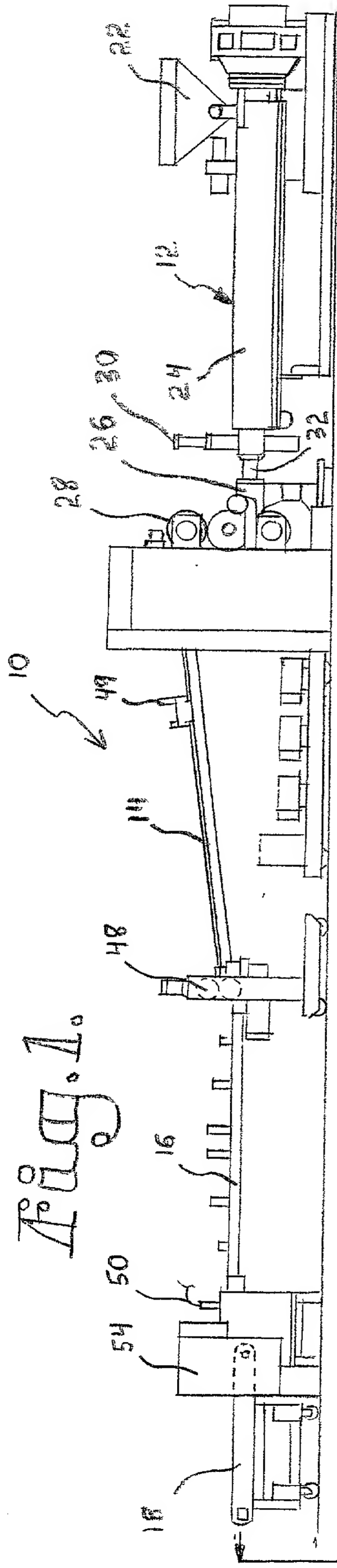
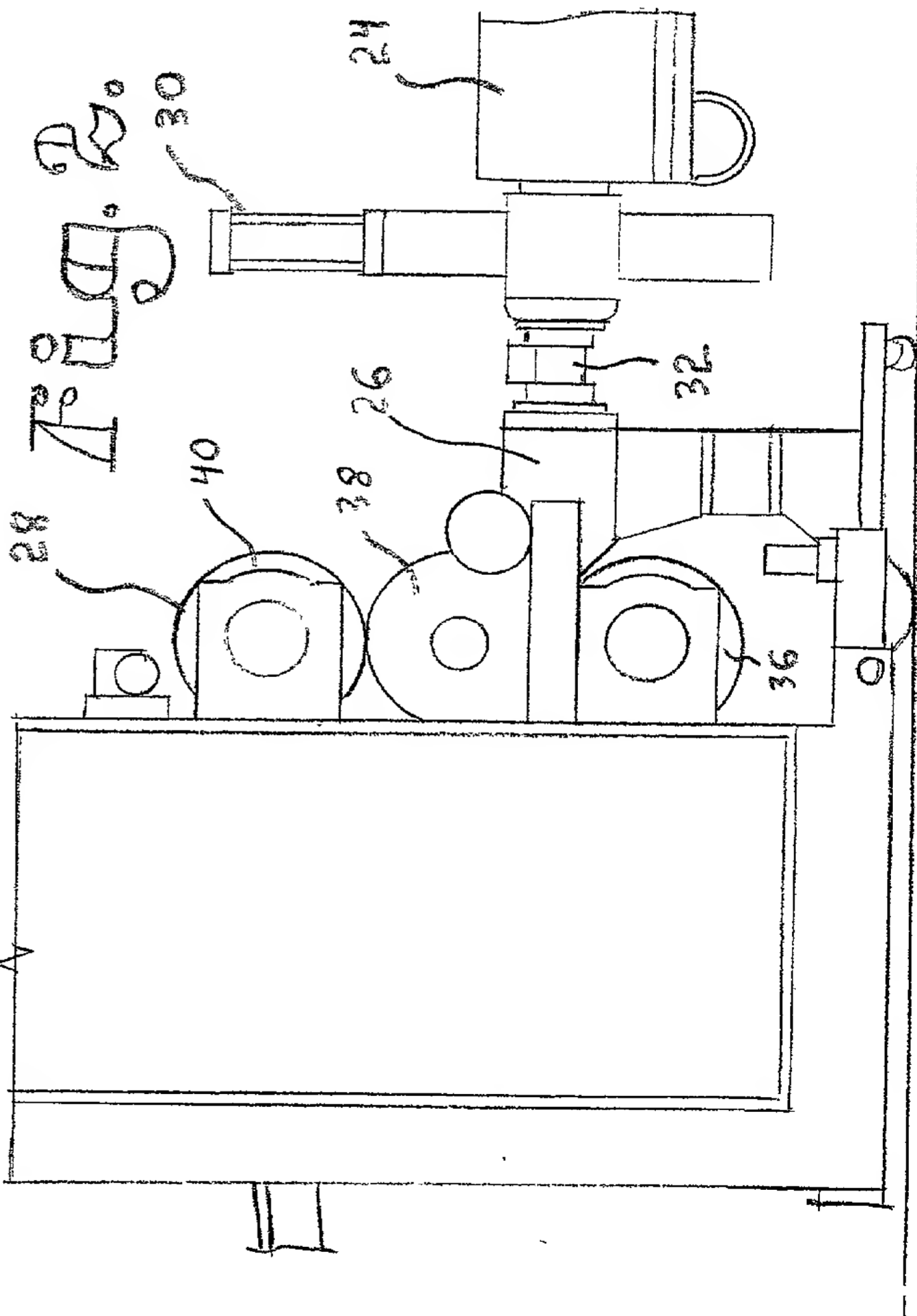
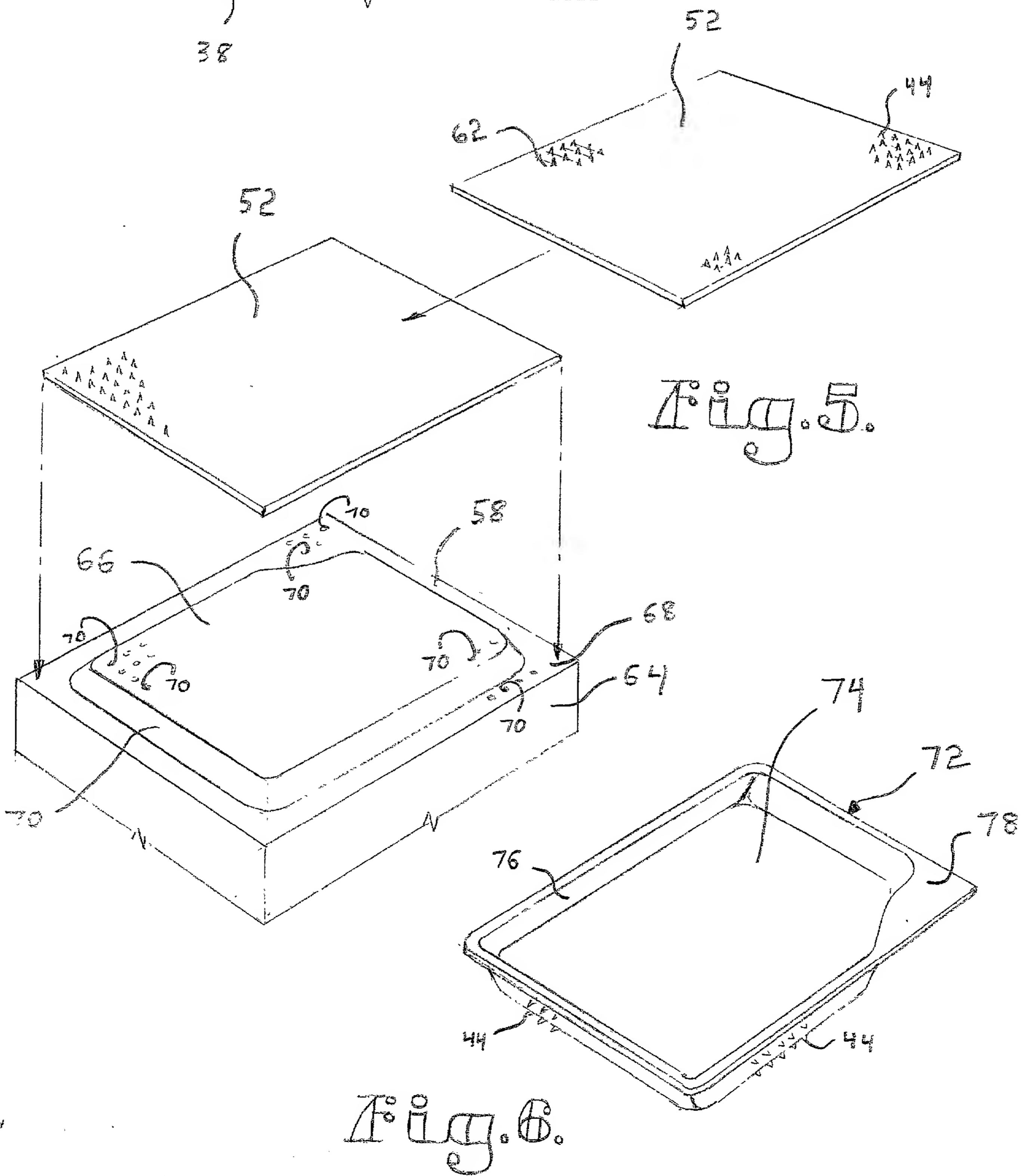
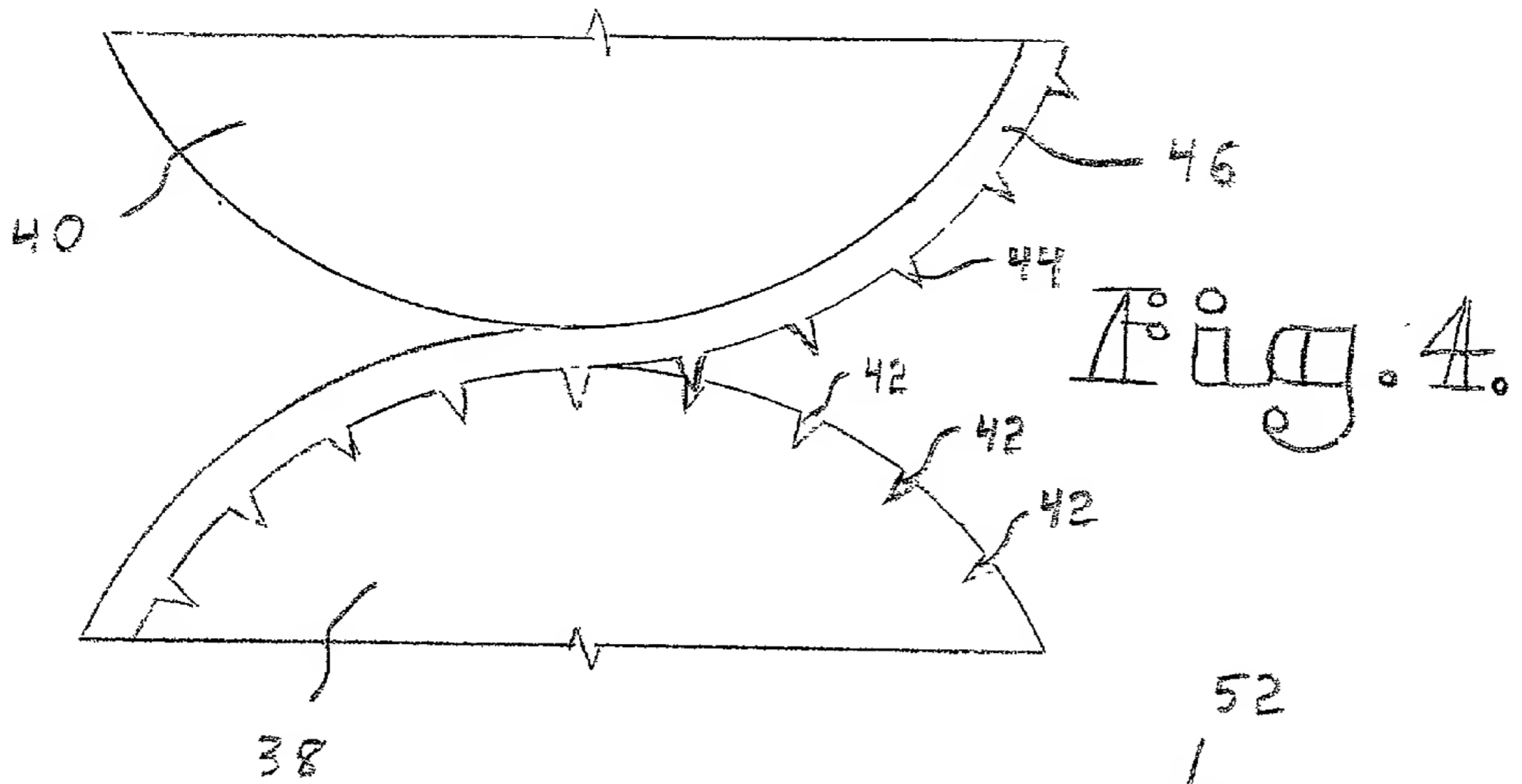


Fig. 3.





**DECLARATION FOR PATENT APPLICATION**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled METHOD FOR PRODUCING CONTOURED VEHICLE FLOOR MATS HAVING INTEGRALLY FORMED NIBS the specification of which is attached hereto.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed: NONE

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application: NONE

I hereby appoint the following attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith and to file and prosecute any corresponding foreign applications, including any international applications under the Patent Cooperation Treaty or the European Patent Convention: William B. Kircher, Reg. No. 22,481; James H. Marsh, Jr., Reg. No. 24,533; J. David Wharton, Reg. No. 25,717; Joseph B. Bowman, Reg. No. 25,807; Richard R. Johnson, Reg. No. 27,452; James H. Riley, II, Reg. No. 31,131; Joan Optican Herman, Reg. No. 31,968; Michael B. Hurd, Reg. No. 32,241; John A. Weresh, Reg. No. 32,332; Patrick A. Lujin, Reg. No. 35,260; Devon A. Rolf, Reg. No. 35,337; Michael J. Gross, Reg. No. 35,528; Daniel W. Shinn, Reg. No. 40,810; B. Trent Webb, Reg. No. 40,865; Susan J. Wharton, Reg. No. 41,524; Timothy C. Bickham, Reg. No. 41,618; Scott B. Strohm, Reg. No. 42,172; and Clinton G. Newton, Reg. No. 42,930, telephone number (816) 474-6550. Address all correspondence to: William B. Kircher, SHOOK, HARDY & BACON L.L.P., One Kansas City Place, 1200 Main Street, Kansas City, Missouri 64105-2118.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Inventor's signature:

Robert D. Tyler 9/29/99  
Robert D. Tyler Date

Residence:

Winfield, County of Cowley, Kansas

Citizenship:

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